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PATENT
Docket No. TUC920030104US1

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appellant:	Jean R. Chang et al.	
Serial No.:	10/648,064	
Filed:	August 26, 2003	Group Art Unit: 2162
For:	**SYSTEM METHOD AND APPARATUS FOR OPTIMAL PERFORMANCE SCALING OF STORAGE MEDIA**	
Examiner:	Dennis Y. Myint	

REPLY BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Examiner:

The USPTO received Appellant's timely Appeal Brief on July 9, 2008 (Appeal Brief), which was filed in response to the Notice of Appeal filed on May 19, 2008, which was filed in response to the Final Office Action mailed February 21, 2008.

This Reply Brief is being filed under the provisions of 37 C.F.R. § 41.41 and in response to the Examiner's Answer mailed April 16, 2009, (hereinafter Answer). Appellant continues to appeal the rejection of pending claims 1, 4, 5, 7, 10, and 12-24.

1. REAL PARTY IN INTEREST

The Examiner's answer agrees acknowledges the identification of the real party in interest for this section in the Appeal Brief filed July 9, 2008, (hereinafter Appeal Brief).

2. RELATED APPEALS AND INTERFERENCES

The Answer agrees with the recitation for this section in the Appeal Brief.

3. STATUS OF CLAIMS

The Answer agrees with the recitation for this section in the Appeal Brief.

4. STATUS OF AMENDMENTS

The after-final amendment of the response of April 21, 2008 was entered by the Examiner on April 7, 2009. Appellants have included the entered amendments to claims 1, 4, and 5 in a listing of the claims appending to the end of this reply. The entered amendments do not change the basic elements that Appellants argue distinguish the claimed invention over the cited prior art.

5. SUMMARY OF CLAIMED SUBJECT MATTER

The Answer agrees with the recitation for this section in the Appeal Brief.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The Answer agrees with the recitation for this section in the Appeal Brief. Appellant did not address the 35 U.S.C. § 101 rejection, but the Answer states that this rejection is withdrawn after entry of the after-final amendment dated April 21, 2008. The Answer maintains substantially the same grounds of rejection for claims 1, 4, 5, 7, 10, and 12-24.

7. CLAIMS APPENDIX

The Answer agrees with the recitation for this section in the Appeal Brief.

8. EVIDENCE RELIED UPON

The Answer cites: United States Patent Number 5,018,060 to Gelb et al. (hereinafter Gelb), United States Patent Number 5,757,571 to Basham et al. (hereinafter Basham), United States Patent Application Publication 2003/0193994 by Stickler (hereinafter Stickler), United States Patent Application Publication 2003/0204672 by Bergsten (hereinafter Bergsten), "Active Storage for Large-Scale Data Mining and Multimedia" Proceedings of the 24th VLDB Conference, New York, USA, 1998 by Erik Riedel et al. (hereinafter Riedel), United States Patent Application Publication 2003/0120379 by Mehlberg et al. (hereinafter Mehlberg)

9. GROUNDS OF REJECTION

The Answer maintains substantially the same grounds of rejection for claims 1, 4, 5, 7, 10, and 12-24, rejecting claims 1, 4, 5, 15-21, and 23 under 35 U.S.C. § 103(a) as being unpatentable over Gelb in view of Basham and in further view of Stickler, claims 7, 10, 12, and 22 under 35 U.S.C. § 103(a) as being unpatentable over Gelb in view of Basham and Stickler and in further view of Bergsten, claims 13 and 14 under 35 U.S.C. § 103(a) as being unpatentable over Gelb in view of Basham, Stickler, and Bergsten and in further view of Riedel, can claim 24 under 35 U.S.C. § 103(a) as being unpatentable over Gelb in view of Basham, Stickler, and Bergsten, and in further view of Mehlberg.

10. ARGUMENT

I. The rejection of claims 1, 4, 5, 15-21, and 23 under 35 U.S.C. §103(a) as obvious in view of Gelb, Basham, and Stickler is improper because Gelb, Basham, and Stickler fail to teach each element of claims 1, 4, 5, 15-21, and 23.

Summary of the Answer in relation to this argument

[001] The Examiner addresses Appellants argument that the combination of Gelb, Basham, and Sticker fail to teach the elements "…receive a dataset for storage on a magnetic tape storage medium **with a storage instruction that does not direct that the dataset is stored with scaling**…" and "…**select a scaling storage instruction in response to storage criteria applied to the storage characteristics that indicate scaling is beneficial** and communicate the selected scaling storage instruction to a storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance and the storage controller stores the dataset on a magnetic tape storage device in response to the scaling storage instruction…" of claim 1 that Appellants summarized as "…selecting a scaling instruction for a dataset that was to be stored with a storage instruction that does not direct that the dataset is stored with scaling…" Answer, page 21, line 18 – page 22, line 2; citing the Response filed November 20, 2007, page 11, first paragraph. See also Appeal Brief, page 14, ¶ 5.

[002] In particular, the Examiner asserts that Gelb teaches the element "…receive a dataset for storage on a magnetic tape storage medium **with a storage instruction that does not direct that the dataset is stored with scaling**…." Answer, page 22, line 19 – page 23, line 13; citing Gelb, col. 13, lines 19-22; col. 19, lines 1-10. The Examiner further asserts that Gelb and Basham teach the element "…**select a scaling storage instruction in response to storage criteria applied to the storage characteristics that indicate scaling is beneficial**...." Answer, page 23, line 13 – page 24, line 12; citing Basham, col. 3, lines 68-71; col. 11, lines 25-30, col. 11, lines 33-36; col. 14, lines 38-43, col. 14, line 64 – col. 15, line 6, col. 15, lines 16-39; Gelb, col. 3, line 65 – col. 4, line 11.

Response

[003] Appellants disagree and respectfully reaffirm the arguments raised against the rejection of claims 1, 4, 5, 15-21, and 23 under 35 U.S.C. §103(a) set forth in the Appeal Brief.

[004] The present invention claims selecting a scaling storage instruction in response to storage criteria applied to storage characteristics that indicate scaling is beneficial for a dataset received with a storage instruction that does not direct that the dataset is stored with scaling. Thus a data set that would benefit from scaling is stored with scaling although the data set is received with a storage instruction that does not direct the data set be stored with scaling. See claim 1. The negative limitation of "...a dataset ...with a storage instruction that does not direct that the dataset is stored with scaling..." distinguishes the claimed invention as the claimed invention selects scaling storage instructions for datasets that are received with a storage instruction that does not direct that the datasets be stored with scaling. Thus applications that do not scale data can still benefit from scaling. See specification, pages 14-15, ¶ 51.

[005] The Examiner asserts that Gelb's teaching of "/*EXCLUDE SYSTEM DATA SETS THAT SHOULD NOT BE SMS-MANAGED */" and non-Storage Management System (SMS) managed data being directed away from controls during a data parse discloses the element "...receive a dataset for storage on a magnetic tape storage medium **with a storage instruction that does not direct that the dataset is stored with scaling**...." Answer, page 22, line 19 – page 23, line 13; citing Gelb, col. 13, lines 19-22; col. 19, lines 1-10.

[006] Appellants respectfully disagree. The Examiner argues that a non-SMS managed data portion is equivalent to a storage instruction that does not direct that a dataset is stored with scaling. See Gelb, col. 18, line 23 – col. 19, line 6. The non-SMS managed data test disclosed by Gelb is used to determine whether other programming handles the data or if the method disclosed by Gelb selects a storage class, management class, and group for the data. Gelb, col. 18, line 68 – col. 19, line 3; fig. 7, ref. 143. Non-SMS managed data refers to data that is not managed in an Interactive System Management Facility (ISMF). Gelb, col. 6, lines 11-14. However, the SMS managed status of data does not determine whether such data is to be stored with scaling. Gelb is silent as to scaling. Gelb therefore does not disclose the negative

limitation of "...a dataset ...with a storage instruction that does not direct that the dataset is stored with scaling..." as Gelb does not disclose scaling. Appellants therefore submit that claim 1, and also claims 7 and 15 are allowable as Gelb and also Basham and Stickler do not disclose the limitation of "...receive a dataset for storage on a magnetic tape storage medium **with a storage instruction that does not direct that the dataset is stored with scaling**...."

[007] The Examiner further asserts that Basham teaches "...**select a scaling storage instruction in response to storage criteria applied to the storage characteristics that indicate scaling is beneficial**...." Answer, page 23, line 13 – page 24, line 3; citing Basham, col. 3, lines 58-61; col. 11, lines 25-30, col. 11, lines 33-36; col. 14, lines 38-43, col. 14, line 64 – col. 15, line 6, col. 15, lines 16-39.

[008] Appellants respectfully disagree. The references in Basham cited by the Examiner teach creating additional scaled partitions (Basham, col. 3, lines 58-61), assorted sizes of fixed-size partitions (Basham, col. 11, lines 25-30), partition sizes established with user input (Basham, col. 11, lines 33-36), data locate efficiencies due to adjacent data items being stored at adjacent locations (Basham, col. 14, lines 38-43), flexible-capacity scaling when data does not fill a tape (Basham, col. 14, line 64 – col. 15, line 6), and serpentine stack segment partitions (Basham, col. 15, lines 16-39). Basham does contemplate various size and organizations of scaled data. However Basham is silent as to selecting a scaling storage instruction for a dataset with a storage instruction that does not direct that the dataset is stored with scaling. Instead, Basham is clearly directed to methods for storing datasets that are stored with scaling storage instructions as there is no teaching in Basham of selecting a scaling storage instruction. In Basham, all data is assumed to be stored with scaling. Appellants therefore submit that Basham and also Gelb and Stickler do not disclose the element "...**select a scaling storage instruction in response to storage criteria applied to the storage characteristics that indicate scaling is beneficial**...."

[009] The Examiner further argues that Gelb's teaching of finding a best suitable storage volume as disclosing "...select a scaling storage instruction in response to storage criteria applied to the storage characteristics **that indicate scaling is beneficial**...." Answer, page 24, lines 8-12; citing Gelb, col. 3, line 65 – col. 4, line 11. Appellants respectfully disagree. As Appellants have discussed above, Gelb is silent as to scaling. Gelb therefore does not disclose

the element of selecting a scaling instruction in response to storage criteria applied to storage characteristics that indicate that scaling is beneficial as claimed for claim 1. Gelb further does not disclose the element of an indication that scaling is beneficial as Gelb does not teach scaling. Appellants therefore submit that claim 1 and also claim 15 are allowable as Gelb, Basham, and also Stickler do not disclose the element "...select a scaling storage instruction in response to storage criteria applied to the storage characteristics that indicate scaling is beneficial...." Appellants further submit that claims 4, 5, 16-21, and 23 are allowable as depending from allowable claims 1 and 15.

II. The rejection of claims 7, 10, 12, and 22 under 35 U.S.C. §103(a) as obvious in view of Gelb, Basham, Stickler, and Bergsten is improper because Gelb, Basham, Stickler, and Bergsten fail to teach each element of claims 7, 10, 12, and 22.

Summary of the Answer in relation to this argument

[010] The Examiner contends that 7, 10, 12, and 22 are properly rejected as the combination of Gelb, Basham, Stickler, and Bergsten disclose the elements "...a dataset to be stored on the magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling ..." and "...select a scaling storage instruction in response to storage criteria applied to storage characteristics of the dataset and communicate the selected scaling storage instruction to the storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance, and the storage controller stores the dataset on the magnetic tape storage device in response to the scaling storage instruction..." discussed above for claim 1. Answer, page 25, line 18 – page 26, line 7.

Response

[011] Appellants respectfully reaffirm the argument above that Gelb and Basham do not disclose the elements "...a dataset to be stored on the magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling ..." and "...select a scaling storage instruction in response to storage criteria applied to storage characteristics of the

dataset and communicate the selected scaling storage instruction to the storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance, and the storage controller stores the dataset on the magnetic tape storage device in response to the scaling storage instruction…" discussed above. Stickler and Bergsten also do not disclose these elements. Appellants therefore submit that claim 7 is allowable. Appellants further submit that claims 10, 12, and 22 are allowable as depending from allowable claim 7.

III. The rejection of claims 13 and 14 under 35 U.S.C. §103(a) as obvious in view of Gelb, Basham, Stickler, Bergsten, and Riedel is improper because Gelb, Basham, Stickler, Bergsten, and Riedel fail to teach each element of claims 13 and 14.

Summary of the Answer in relation to this argument

[012] The Examiner contents that claims 13 and 14 are properly rejected as claim 7 is properly rejected. Answer, page 26, lines 13-18.

Response

[013] Appellants respectfully reaffirm the arguments in part I that Gelb and Basham do not disclose the elements "…a dataset to be stored on the magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling …" and "…select a scaling storage instruction in response to storage criteria applied to storage characteristics of the dataset and communicate the selected scaling storage instruction to the storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance, and the storage controller stores the dataset on the magnetic tape storage device in response to the scaling storage instruction…." Stickler, Bergsten, and Riedel also do not disclose these elements. Appellants therefore submit that claims 13 and 14 are allowable as depending from allowable claim 7.

IV. The rejection of claim 24 under 35 U.S.C. §103(a) as obvious in view of Gelb, Basham, Stickler, Bergsten, and Mehlberg is improper because Gelb, Basham, Stickler, Bergsten, and Mehlberg fail to teach each element of claim 24.

Summary of the Examiner's Answer in relation to this argument

[014] The Examiner argues that the rejection of claim 24 is proper as claim 7 is properly rejected. Answer, page 27, lines 1-5.

Response

[015] Appellants respectfully reaffirm the argument in part I that Gelb and Basham do not disclose the elements "…a dataset to be stored on the magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling …" and "…select a scaling storage instruction in response to storage criteria applied to storage characteristics of the dataset and communicate the selected scaling storage instruction to the storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance, and the storage controller stores the dataset on the magnetic tape storage device in response to the scaling storage instruction…" of claim 7. Stickler, Bergsten, and Mehlberg also do not disclose these elements. Appellants therefore submit that claim 24 is allowable as depending from allowable claim 7.

SUMMARY

In view of the foregoing, Appellants respectfully assert that each of the claims on appeal has been improperly rejected because the rejections under 35 U.S.C. §103(a) are improper. Therefore, Appellants respectfully request reversal of the Examiner's rejections under 35 U.S.C. §103(a), and urges that pending claims 1, 4, 5, 7, 10, and 12-24 are ready for prompt allowance. Appellants appeal to the Board's objective and reasoned decision on this matter.

Respectfully submitted,

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11. RELATED PROCEEDINGS APPENDIX

The Examiner's Answer agrees with the recitation for this section in the Appeal Brief.

Claims Appendix

The claims involved in the appeal, namely claims 1, 4, 5, 7, 10, and 12-24, are listed below.

1. An apparatus for selecting storage media scaling to improve data access performance, the apparatus comprising:

a reception module implemented in software stored on a memory device for execution on a processor and configured to receive a dataset for storage on a magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling;

an identification module implemented in software stored on the memory device for execution on the processor and configured to identify storage characteristics of the dataset, wherein the storage characteristics comprise compaction, expiration dates, and media interchange specifications; and

a scaling module implemented in software stored on the memory device for execution on the processor and configured to select a scaling storage instruction in response to storage criteria applied to the storage characteristics that indicate scaling is beneficial and communicate the selected scaling storage instruction to a storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance and the storage controller stores the dataset on a magnetic tape storage device in response to the scaling storage instruction.

4. The apparatus of claim 1, further comprising a determination module implemented in software

stored on the memory device for execution on the processor and configured to store a plurality of predefined storage criteria and compare the storage characteristics of the received dataset with the predefined storage criteria to determine the storage instruction.

5. The apparatus of claim 1, further comprising a mapping module implemented in software stored on the memory device for execution on the processor and configured to track capacity information for the magnetic tape storage medium that stores the dataset.

7. A system for scaling a storage medium to improve data access performance, the system comprising:

a network configured to communicate data;

a storage controller coupled to the network;

a magnetic tape storage device having a magnetic tape storage medium configured to store data received from the controller over the network;

a host coupled to the network, the host configured to exchange data with the controller;

an application operating within the host, the application configured to produce a dataset to be stored on the magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling;

an identification module implemented in software for execution on a processor and configured to identify storage characteristics of the dataset that indicate scaling is beneficial, wherein the storage characteristics comprise compaction, expiration dates, and media interchange specifications; and

a scaling module configured to communicate with the application and select a scaling storage instruction in response to storage criteria applied to storage characteristics of the dataset and communicate the selected scaling storage instruction to the storage controller, wherein the scaling storage instruction comprises an instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance, and the storage controller stores the dataset on the magnetic tape storage device in response to the scaling storage instruction.

10. The system of claim 7, wherein the scaling module is configured to store a plurality of predefined storage criteria and compare the storage characteristics of the dataset with the predefined storage criteria to determine the storage instruction.

12. The system of claim 7, wherein the scaling module operates within the host.

13. The system of claim 7, wherein the scaling module operates within the storage controller.

14. The system of claim 7, wherein the scaling module operates within the magnetic tape storage device.

15. A computer readable storage medium comprising computer readable code configured to carry out a method for selecting storage medium scaling to improve data access performance, the method comprising:

receiving a dataset to be stored on a magnetic tape storage medium with a storage instruction that does not direct that the dataset is stored with scaling;

identifying storage characteristics of the dataset, wherein the storage characteristics comprise compaction, expiration dates, and media interchange specifications;

determining based on storage criteria and the storage characteristics that indicate scaling is beneficial whether to scale the magnetic tape storage medium that will store the dataset; and

selecting a scaling instruction to scale the magnetic tape storage medium to a predefined capacity for optimal data access performance according to the determination, wherein a storage controller stores the dataset on a magnetic tape storage device in response to the scaling instruction.

16. The computer readable storage medium of claim 15, wherein the method further comprises defining a plurality of storage characteristics as storage characteristics that require storage on optimally scaled magnetic tape storage medium.

17. The computer readable storage medium of claim 15, wherein the method further comprises defining a plurality of storage characteristics as storage characteristics that require storage on maximum capacity magnetic tape storage medium.

18. The computer readable storage medium of claim 15, wherein determining further comprises

identifying storage characteristics that satisfy storage criteria for storing the dataset on optimally scaled magnetic tape storage medium.

19. The computer readable storage medium of claim 15, wherein determining further comprises identifying storage characteristics that satisfy storage criteria for storing the dataset on maximum capacity magnetic tape storage medium.

20. The computer readable storage medium of claim 15, wherein the method further comprises tracking capacity information for the magnetic tape storage medium that stores the dataset.

21. The apparatus of claim 1, wherein the scaling module is further configured to select the scaling storage instruction using a pre-defined look-up table containing a plurality of datasets that determine whether the received dataset is to be scaled.

22. The system of claim 7, wherein the scaling module is further configured to select the scaling storage instruction using a pre-defined look-up table containing a plurality of datasets that determine whether the received dataset is to be scaled.

23. The method of claim 15, wherein a pre-defined look-up table containing a plurality of datasets determines whether the received dataset is to be scaled.

24. The system of claim 7, the system further comprising an accessor configured as a robotic arm

with a cartridge gripper and a bar code scanner mounted on the cartridge gripper, wherein the accessor transports the magnetic tape storage medium to the magnetic tape storage device.